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Innovation and Entrepreneurship Information Data Service Platform for College Students in Ordinary Colleges and Universities

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Abstract: My country pays more and more attention to students' innovation and entrepreneurship (IAE) education. With the support of policies, colleges and universities (CAU) have carried out IAE education practice and teaching, with the purpose of mobilizing students' enthusiasm for IAE and cultivating students' entrepreneurial practice ability. Drive employment by entrepreneurship, so that the comprehensive quality of college students can be improved, and the entrepreneurial ability has been strengthened. Designing a data service platform for college students' IAE information for ordinary CAU to guide students to learn IAE skills is also an emerging school-running concept in the process of higher education teaching reform and development, which opens up a new way for college students to find employment. In this paper, after the platform is designed, its operation and performance are tested. The test results are in line with the design expectations, and the data storage and modification of the platform are also realized.

1. Introduction

Due to the lack of effective management methods in the practice of IAE training, there are many problems in the process of construction, operation and management. At the same time, many students lack practical experience, funds, and guidance in IAE, resulting in the ineffectiveness of IAE education in schools, and it is difficult to achieve high-level IAE. In response to these problems, this paper designs an information data service platform for college students' IAE to realize the information connection between enterprises and universities, so that students can find entrepreneurial projects according to their own needs.

At present, in-depth research has been carried out on the design and implementation of the information data service platform for college students' IAE at home and abroad. For example, some

developed countries have established IAE bases one after another, and the development of IAE education has been very mature. The management of their IAE bases generally adopts the enterprise management method, providing students with sufficient innovation resources and resource support, creating a very good environment for students. The IAE hub can greatly mobilize the motivation of students' IAE [1]. After experiencing initial difficulties and setbacks, domestic IAE education corrects the mistakes of IAE education. Governments and schools across the country have invested heavily in establishing IAE bases to correctly guide the direction of IAE of college students. After years of accumulation of experience, the development of education in my country has been promoted, and the entrepreneurial enthusiasm of college students has gradually increased [2-3]. Although college students have carried out more IAE activities, their enthusiasm for entrepreneurship is still not high. To stimulate students' interest in innovation and entrepreneurship, it is necessary to provide students with effective channels to obtain entrepreneurial information.

This paper first expounds the functional requirements and design principles of the platform design, and then uses MySQL as the database to develop a data service platform for college students' IAE information. The TF-IDF algorithm is introduced into the platform to recommend IAE news with similar content to users. The platform has undergone performance testing and function implementation to ensure the normal operation of the platform.

2. Platform Design Requirements and Principles

2.1 Analysis of Platform Functional Requirements

The establishment of the IAE information data service platform aims to support the IAE of college students, an information release platform established on the Internet to serve students and units, and to achieve better employment. Therefore, the actual needs of the work are fully considered in terms of operation and use. Before website development, a requirement analysis should be carried out on the development goals and the functions to be performed [4].

The users of the information data service platform have different purposes and different needs, so the users are classified, and the functional requirements are analyzed from the user's point of view. This platform is mainly for classless users, and realizes different functions for different users.

Ordinary user operation terminal: To achieve a general understanding of the IAE of our school for ordinary users, and to anonymously consult the employment work of colleges and universities and provide written guidance for students' entrepreneurship guidance [5].

Student user operation terminal: enable students to keep abreast of the latest IAE policies and trends; maintain personal data in real time, inquire about reviewed unit information and recruitment information; relevant guidance and help [6].

Department administrator operation terminal: realize the real-time maintenance of the department information by the department administrator; manage the student resources of the school; publish the dynamic news of IAE for students to know; obtain the work guidance of the IAE department through mailbox messages.

Unit user operation terminal: realize online registration of unit users and real-time maintenance of unit information; publish recruitment information of the unit; view graduate resources of the school, search for required professionals, and collect outstanding graduates; can send interview notices to graduates and other information exchanges [7].

The operation terminal of the administrator of the IAEp department: realize the maintenance of various dynamic information resources by the administrator; manage the related work of the colleges and departments; exchange user messages with each user; maintain the IAE consulting

function module and give instant answers; maintain the overall data of the platform source [8].

2.2 Platform Design Principles

In order to ensure the successful construction of the platform and the smooth operation in the later stage, certain design principles must be followed before the development and design. According to different types of systems and different application scenarios, the design principles of the systems are different [9]. This project belongs to the network application platform, and the following main principles should be followed in the planning and design.

(1) Reliability and availability: The reliability of the platform is mainly reflected in the reliability of software products and the reliability of hardware support. The reliability of the software should ensure that the business logic of the software product is correct, the software system is stable, and the data preservation is complete and safe. Hardware reliability should guarantee the high availability of equipment and the possibility of returning to normal use within a certain period of time in the event of a failure [10].

(2) Standardization and flexibility: The flexibility here means that the platform can adopt standardized technical indicators with other systems to facilitate integration with other systems [11].

(3) Rapid development/rapid modification: This principle means that a platform based on a data-driven application development framework can quickly deploy new features, modify original functions, and update existing features without affecting the normal use of the original features [12].

2.3 News Recommendation Based on Content Similarity

The innovation and entrepreneurship news recommendation module mainly uses the TF-IDF algorithm and Word2vec to convert news texts into document vectors. The specific process is as follows. The transformation of word vectors is implemented using Word2vec. The IDF calculation method of word a is:

$$IDF(a) = \log(N / M + 0.01) \tag{1}$$

Among them, N is the total number of training documents, and M is the number of documents in which word a appears in the training document set.

The calculation formula of TF-IDF is as follows:

$$K(a, T_i) = \frac{af(a, T_i) \times itf(a)}{\sqrt{\sum_{i \in T_i} \left[af(a, T_i) \times itf(a) \right]^2}} \tag{2}$$

Among them, T_i is the ith document, and $af(a, T_i)$ is the word frequency of word a in the ith document.

3. Platform Design

3.1 Platform Function Module Design

The functional modules of the IAE information data service platform can be divided into six modules as shown in Figure 1. The functions of each module are introduced as follows.

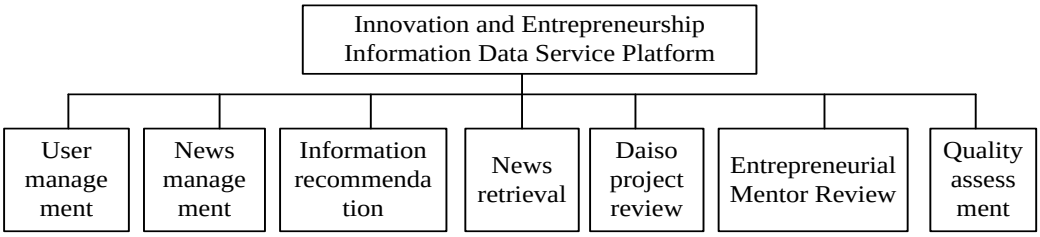

Figure 1: Functional Module

(1) User management module

Enterprise users mainly publish the cooperation needs of enterprises and analysis of the development trend of the industry. Student users are mainly for college students, and the core functions provided include providing relevant policies and regulations, enterprise needs and quality assessment of IAE, and at the same time, providing the function of exchanging IAE experience. Expert users are mainly responsible for reviewing entrepreneurial innovation mentors and projects. User authorization management is mainly to authenticate users. Authorize user operations to prevent unauthorized user operations.

(2) News management module

This module mainly includes news release, news moderation and news deletion. The news of the system mainly includes IAE information, policies and regulations, and major project information. Both enterprise users and school-level administrators can publish IAE trends. School-level managers can also publish schoolIAE education resources. But that content should be checked by some admins and teachers before it appears on the platform. Admin teachers need to moderate newly published news. Administrators can also post innovation, entrepreneurial information and related policy announcements. Existing news, administrators and owners have the right to delete the news.

(3) Information recommendation module

This module mainly recommends IAE information or enterprise IAE projects to college students. This module recommendation mainly recommends relevant IAE content to users according to the text similarity. In addition, it also includes a hotspot recommendation function. This section mainly recommends the most clicked news and newly released news.

(4) News retrieval module

This module mainly provides the search function within the site. Students search for relevant content using keywords, which can come from news headlines or news content. Also, make sure that deleted news doesn't appear in the indexed content. Most of the news content is in Chinese, and it is necessary to analyze Chinese as a word unit division.

(5) Daiso project review module

This function is mainly for administrator teachers and school administrators. Administrator teachers are responsible for setting the Daiso project review rules and assigning places to each school. Evaluation rules generally include expert grouping rules and evaluation rules. The school-level administrator is responsible for uploading the school's Daiso project review materials. After each university completes the uploading of materials, the expert group will review each Daiso project. Admin teachers can view and export review results.

(6) Entrepreneurial mentor evaluation module

This function is mainly used for IAE mentor selection and IAE mentor information management. Designated administrator teachers can assign recommended tutor quotas and revise rules to

individual CAU. The school administrator will then upload the profile of the proposed school teacher.

(7) Quality assessment module

This is mainly for student users. Admin teachers can upload assessment rules for analysis of assessment results. Student users can use this module to evaluate innovative thinking and psychological quality to help students choose careers and plan their entrepreneurial direction.

3.2 Platform Database Design

Database design is to establish a database model according to the operating requirements of the system, and then select an appropriate database. The database is mainly divided into two parts, the MySQL database is mainly responsible for storing data, and the MySQL Redis database is mainly responsible for caching data. When data changes, the system first updates the data in MySQL, and then deletes the data stored in Redis. In Redis, user information data is set to have an expiration date, which is the same as the login period.

All information on the platform must be stored in a database. Database design is a powerful link. The quality of the design will directly affect the performance of the platform. The efficiency of the database is reflected in the efficiency of access and storage. According to the actual needs of the innovation and entrepreneurship information data service platform, from the perspective of security, administrators need to coordinate all platform management, and their identity information is also very important, so a special database is designed to access innovation and entrepreneurship department administrators, The user name and password of the administrator of the department, as well as the query table for saving the logs of these two types of administrators; a database is also designed to store information related to IAE for data update and backup.

4. Platform Testing and Implementation

4.1 Platform Test

Testing principles are primarily formulated from the user's point of view and the developer's point of view. The user's goal is to find out all the deficiencies in the platform before it is officially used, and the developer's goal is to pass all the tests of the platform smoothly, proving that the platform can achieve the expected goals.

(1) Run the test

Table 1: Run Test Results

Test items	Test value
CPU usage	36%
Memory usage	25%
Average number of responses per second	6724
Average throughput	2341687

This article tests CPU usage, memory usage, average responses per second, and average throughput (the amount of data transferred per second by platform ports). The results are shown in Table 1. The CPU usage rate is 36% and the memory usage rate is 25%, both of which are relatively small, indicating that the platform does not need to occupy too much storage capacity when running. The average number of responses per second is 6,724, indicating that users can respond to user requests for 6,724 times when using the platform. The information data transmitted by the platform

per second can reach 2,341,687 bytes, and the amount of data transmission is very large.

(2) Performance test

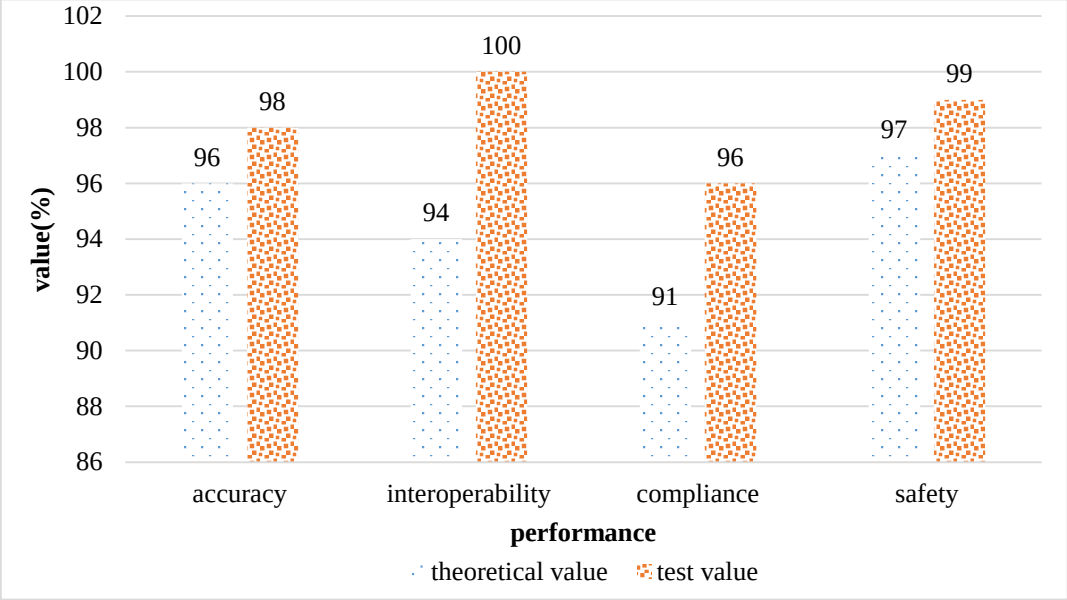

Figure 2: Performance test results

This experiment tests the accuracy, interoperability, compliance and security of the platform. Accuracy refers to the software attributes related to whether the results of the platform operation are correct or conform to the objective situation, or whether the reflected effects are accurate. Interoperability refers to the software attributes related to the data interaction or data conversion between the platform and other specified software systems. For example, the original student data of the platform needs to read the basic information of students in the original educational administration system, and the employment information service platform needs to count the number of students to facilitate the management of alumni. Compliance refers to the software attributes of the relevant standards and regulations that the platform system software needs to follow. Security refers to the software attributes of the permission control capability for unauthorized intentional or accidental access, such as user and role permissions, database field encryption, SQL injection vulnerabilities, etc. The test results are shown in Figure 2. According to the results, it can be seen that the test value of each performance is greater than the theoretical value, which means that the system performance meets the design requirements.

4.2 Platform Implementation

(1) Platform front-end implementation

The homepage of the platform mainly displays news related to IAE and provides access to other system modules. Each news column on the home page is an instance of a news component, which is directly bound to a VUE component. When you need to get the news list through Ajax, you can directly update the front panel data through the VUE Update Recall function. Users can access other units of the system by clicking on the entrances of other units of the system.

(2) Platform data access implementation

Data storage is mainly done through MySQL and Redis. According to these two databases, Hibernate and Jedis are used for data manipulation. Hibernate is mainly responsible for executing

data in MySQL, and Jedis, as a Redis Java client, is mainly used to run Redis. When the data changes, first update the MySQL database, and then delete the original Redis cache. Rearranging the cache can cause temporary inconsistencies between cached data and MySQL data. The stability and integrity of the data is usually guaranteed by the MySQL database, and appropriate code checks are added.

5. Conclusion

It is of great significance to carry out innovation and entrepreneurship education for ordinary college students to help students find employment. Therefore, this paper designs an IAE information data service platform, where student users can query enterprise innovation projects, and enterprise users can also view students' innovation achievements through this platform to realize information interaction. The results of the platform performance test show that the platform designed in this paper can be put into use, and its functions meet the needs of users.

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